Twin Rock Irrigation Ditch (Twin Rocks Ditch)
Following the west bank of Animas River,
east of U.S. Highway 550
Bondad vicinity
La Plata County
Colorado
(Riverside vicinity
San Juan County
New Mexico)

HAER No. CO-68

HAER
COLO,
33-BON.V,
1-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
Rocky Mountain Regional Office
National Park Service
U.S. Department of the Interior
P.O. Box 25287
Denver, Colorado 80225

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HISTORIC AMERICAN ENGINEERING RECORD

Twin Rock Irrigation Ditch
(Twin Rocks Ditch)

HAER No. CO-68

Location: Follows the west (right) bank of the Animas River from a point approximately 0.9 miles south of Bondad, La Plata County, Colorado, to a point about 2.8 miles south of the Colorado-New Mexico state line in San Juan County, New Mexico.

Quad: Ditch heading - Bondad Hill, CO
Ditch alignment - Bondad Hill, CO
Long Mountain, CO
Mount Nebo, NM-CO
Cedar Hill, NM-CO
Ditch terminus - Cedar Hill, NM-CO

UTM: A 13.4102530.244330
B 13.4095270.243340

Date of Construction: 1887; enlarged in December 1902

Present Owner: Twin Rocks Ditch Company

Present Use: Irrigation ditch. About 4,700 feet of unlined, open-channel irrigation ditch and 750 feet of existing earth-covered corrugated metal pipe is to be replaced by earth-covered corrugated metal pipe is to be replaced by earth-covered corrugated metal pipe. Projected dat of replacement is spring 1991.

Significance: The Twin Rock Irrigation Ditch is integral to the settlement and agricultural development of the community of Riverside, New Mexico. Today, the ditch continues to serve agricultural purposes, as originally intended.

Historian: Sandra L. Rayl
U.S. Army Corps of Engineers
Albuquerque District

February 1991

I. HISTORY

A. Purpose of the Ditch

The Twin Rock Irrigation Ditch heads in Colorado and serves the farming community of Riverside, New Mexico. The ditch was constructed in 1887 for the purpose of diverting water for irrigation, domestic use, and livestock watering and continues to serve that purpose. [1]

By the time the Twin Rock Ditch was constructed in 1887, at least two other ditches in the immediat vicinity had been constructed and were in use. They were the Ralston Ditch, located on the east bank of the Animas River, approximately 1.5 miles downstream of the Twin Rock Ditch diversion (priority date in which water was first diverted--1886); and the Cedar Hill Ditch, located on the west bank of the Animas River, which heads at the D&RGW railroad bridge near the downstream terminus of the Twin Rock Ditch (priority date 1878). Both continue to serve their original purpose for crop and orchard irrigation.

B. Construction Chronology

The original construction of the Twin Rock Irrigation Ditch (also known as Twin Rocks Ditch) began on November 1, 1887, with a width of 66 inches (5.5 feet) and a depth of 2.0 feet. In December 1902, the ditch was enlarged to 85 inches (7.0833 feet) in width and 3.0 feet in depth, with a fall of 24 inches per mile to accommodate expanding downstream irrigation needs. The average carrying capacity of the channel was 25.0 cubic feet of water per second. [2] The maximum allowable diversion rate at the heading was 8.62 cubic feet per second. [3]

C. Location

The headgate (diversion point) was located on the west (right) bank of the Animas River in Township 32 North, Range 9 West, Section 7, La Plata County, Colorado. From the headgate, the ditch extended southerly approximately 2.1 miles to the New Mexico-Colorado state line and thence 2.8 miles to the terminus in Township 32 North, Range 10 West, Section 22, San Juan County, New Mexico.

II. THE DITCH

A. Description

The Twin Rock Ditch serves 25 water users on approximately 400 acres of irrigated land, 65 acres in Colorado and 345 acres in New Mexico. The major portion of cropland is dedicated to alfalfa and irrigated pasture. Irrigation water is diverted from the Animas River by way of a rock diversion dam located on the west bank of the Animas River, upstream of Twin Crossing.

The Twin Rock Ditch is a gravity-based irrigation system, which falls approximately two to five feet to the mile. The first step in establishing a gravitation ditch is to calculate the approximate arable acreage, then select the proper diversion point along the stream or river, which will maintain the proper grade for gravitation flow to the fields to be irrigated. The diversion point for the Twin Rock Ditch was selected to ensure an adequate supply of water for the Riverside fields.

The heading and initial 2.1 miles of ditch are located in a steep, narrow portion of the Animas Valley, known as Twin Crossing. Within Colorado, the only suitable cultivable land served by the Twin Rock Ditch is a small pocket of about 65 acres, which is located immediately below Twin Crossing. South of the New Mexico-Colorado state line, the valley widens and offrs more suitable farmland.

The 4.9-mile-long Twin Rock Ditch was originally of earth-lined, open-channel design (see HAER Photograph Nos. CO-68-1 and CO-68-2), except for approximateoly 700 feet of ditch located south of the Denver and Rio Grande Western (D&RGW) railroad bridge, which was cut through a sandstone bluff (see HAER Photograph No. CO-68-7_. The heading structure consists of a concrete headwall with slide gate to control the flow of water into the ditch (see HAER Photograph No. CO-68-8). The ditch terminus consists of a turnbox with sluice that diverts water into a wasteway, whieh directs the flow back to the river (see HAER Photograph No. CO-68-10).

Interviews were condueted in January 1991 with two long-time area residents, Mrs. Josephine Bonds and Mrs. Edith Rhodes, who have some knowledge of the history of the ditch's construction and usage. Mrs. Bonds has lived in the Riverside, New Mexico-Bondad, Colorado, area since her birth in 1901. Her father, Edward Hendricks, a Canadian emigrant, and mother, the former Catherine Gertrude O'Brien of Washington, D.C., were among the earliest homesteaders in the area. They settled in the Riverside area in the 1880s and established a farm and a 400-tree apple orchard, the largest orchard in the Riverside area. During the spring and summer months, Mr. Hendrieks cleared and farmed the land, planting fields in corn, hay, and wheat. During the fall and winter months, he would leave the farm and his family to prospect in nearby San Juan and LaPlata mountains of Colorado. [3]

Mrs. Edith Rhodes, another long-time resident, was born in Earlton, Kansas, in 1904 and moved to Bondad in January 1905. She has lived in the Durango-Bondad, Colorado, area virtually all her life. Her grandfather, a Union soldier and millwright, from Wheeling, West Virginia, was one of the first Bondad homesteaders. [5]

Mrs. Bonds recalls that her father, Edward Hendricks, had helped to construct the Twin Rock Ditch and had served for many year as one of its first commissioners. Mrs. Rhodes contributed the names of other individuals who most likely helped to construct the ditch, and who might also have served as commissioners. They inclusde William Pieper, August West, Charles Hangar, Mr. McDaniel, and Mr. Masters. Both informants remembered having been told as children that horses, slips, scrapers, pick axes, and shovels were the primary tools used in construction of the ditch. They were also told that dynamite was used to blast out the 700-foot-long section within the sandstone bluff. [6]

Mrs. Bonds further recalled that the Twin Crossing section of ditch had proved difficult to maintain since its construction. On several occasions during her childhood, she had accompanied her father on horseback to the ditch heading during violent thunderstorms to close the headgate in order to prevent the ditch from washing out. She recalls that after the storms work crews cleaned out the large rocks that had rolled down the steep embankment above the ditch. [7]

B. Regional History

Opening of the San Juan Country

Anglo-American settlement of the San Juan country of southwestern Colorado and northwestern New Mexico was accomplished through a series of actions which established reservations for the Utes, Navajos, and Jicarilla Apaches, and which incorporated former Indian lands into the public domain. These public lands were then opened for general homesteading.

Colorado

The Pike's Peak gold rush of 1859 brought scores of prospectors into what would later become the Colorado Territory. As a result of the gold rush and various silver strikes, Colorado boomed and, in 1861, the Territory of Colorado was organized.

By 1860, miners were prospecting the western slope of Colorado and beyond. In 1870, gold had been discovered in the San Juan and La Plata mountains of southwestern Colorado in the heart of the newly-created Ute Indian reservation. The Ute treaty reservation was established in 1868. In essence, the reservation covered the western third of Colorado, including the Twin Rock Ditch area. The purpose of the reservation was to remove the Utes from areas deemed suitable for Anglo-American settlement, particularly the San Luis Valley, and to consolidate all of the Ute bands to facilitate their management. Almost immediately after the reservation boundaries were established, Coloradans, seeking to gain complete access to Ute lands in southwestern Colorado, objected and called for the removal of the Utes from Colorado.

In direct violation of the 1868 treaty, large numbers of miners poured into the reservation. Unable to halt these incursions, Congress authorized the Secretary of the Interior to negotiate with the Utes for the relinquishment of the mineral-rich mountainous territory that comprised the heart of the 1868 reservation. [8]

In 1873, the Utes signed the Brunot Agreement, giving up claim to approximately 3.5 million acres in the San Juan mountains. On April 29, 1874, the Brunot Agreement of San Juan Cession was signed into law by President Ulysses S. Grant. This action removed a 60 x 90-mile rectangular section from the middle of the 1868 reservation, essentially dividing the reservation into two parts. The southern part was reduced to a narrow strip of land 110-miles long, running from the Utah boundary east along the New Mexico-Colorado border and running due north--land within the current Ute Mountaub and Southern Ute reservations. [9] Only a narrow strip of land twenty miles wide along the western Colorado border connected the northern and southern portions of the 1868 reservation.

The opening of the ceded lands brought a rush of homesteaders and prospectors into the region. Colorado became a state in 1876 and, once again, citizens clamored for the complete removal of the Utes from Colorado, alleging that Indians would discourage settlers. In 1879, an incident occurred that focused national attention on the Ute situation and generated public support for Ute removal from Colorado. Protesting the plowing of grazing land for agricultural use and the agent's decision to call in troops to counter the protests, twenty-five White River Utes stormed the White River agency, killing the agent and eight others. [10]

On June 15, 1880, Congress ratified an agreement with the Utes. The agreement provided for theremoval of the White River and Uncompaghre Utes to Utah and the relocation of the Southern Utes to the La Plata River in Colorado. If sufficient unoccupied agricultural and grazing lands were not available in Colorado, then unoccupied lands along the La Plata in New Mexico were to be considered. The lands along the La Plata were to be surveyed and then allotted in severalty to the Indians. Surplus lands not taken by the Utes were to become available for purchase by settlers, with the money to be set aside for the benefit of the Indians. [11]

George Manypenny, Commissioner for the Southern Utes, and Henry Page, U.S. Agent for the Southern Utes, examined the La Plata lands and concluded that there was insufficient land to support the three Southern Ute bands by agriculture. Of the 864,000 acres on the reservation, only about 21,000 were irrigable. Manypenny ordered a survey of the Mancos, Animas, and Florida rivers, which angered non-Indians who were expecting these lands to be soon opened for purchase. [12]

On September 7, 1881, the last band of Northern Utes left Colorado and, in June 1882, Congress opened six million acres of former Ute land to public settlement. That left only the Southern Utes, situated on their narrow reservation in the extreme southwestern corner of Colorado. With the opening of the vast new territory, hundreds of anxious homesteaders, prospectors, farmers, ranchers, and townsite promoters rushed to occupy the newly opened valleys. [13]

Officials with the D&RG Railroad staked out the townsite of Durango, Colorado (located within the former San Juan cession area) on September 13, 1880, and by December, Durango's population was reaching 3,000. Most of the people came from the nearby community of Animas City, located about 1.5 miles to the north. [14] By July 1881, the D&RG Railroad had laid the tracks for its Chama, New Mexico, to Durango, Colorado, line through the Southern Ute reservation without obtaining prior consent. By the following July, the trackage had reached Silverton, completing the linkage between the mines and the shipping center at Durango. By the mid-1880s, Durango was not only a mining center, but had also become an important shipping point for the rich farming areas along the Animas River and for the cattle ranches in the mountains and plateaus to the west. [15]

The General Allotment Act of 1887 (also called the Dawes Severalty Act) ushered in the allotment era and set the tone for the change in federal policy from isolation to assimilation. The Dawes Act provided for allotment of lands in severalty to individual Indians. Surplus lands were to be held in trust by the United States and administered for the benefit of the tribes. The intent of the act was to make the Indians productive citizen-farmers. The avowed purpose was to abrogate Indian tribal organization, abolish the reservation system, and assimilate the Indian into the body politic. Thus, the government would sever its relationship with the Indians forever. Behind the push for allotting tribal lands to individuals was the desire to open the surplus unallotted lands to non-Indians. From 1880 to 1894, no ewer than twelve Congressional bills were introduced, calling for the removal of all Southern Ute banks from Colorado to San Juan County, Utah, and each time they failed to pass. [16] Opposition to these measures from the citizens of Utah led to a legislative agreement which located the Southern Utes on their former reservation land in southwestern Colorado.

The push to remove all Utes from Colorado lost support in the Congress when, in 1894, Illinois Congressman Andrew J. Hunter introduced a bill that would allot to individuals Utes land within the Southern Ute reservation, remove the special reservation land status from the allotted lands, and open up the remaining land to non-Indian settlement. [17] The legislation was passed and signed into law

by President Grover Cleveland on February 11, 1895. The "general law for settling Indians in severalty" (General Allotment Act of 1887 or the Dawes Act) referred to in the 1895 agreement with the Southern Utes provided that the land allotted to individual Indians would be held in trust for 25 years, and then patents in fee simple would be issued. [18]

Utes who opposed allotments hy the establishment of a reservation of unallotted land, the Ute Mountain Ute Reservation, located west of the range line between Range 13 and Range 14 of the New Mexico Principal Meridian, plus all of Township 31 and 32 of Ranges 14, 15, and 16, west of the New Mexico Principal Meridian within the Territory of New Mexico. [19] Since Chief Ignacio and his Weeminuche band were already settled in that area, they elected to remain.

Members of the Capote and Mouache Ute bands accepted allotments within the eastern portion of the reservation. Approximately 72,811 acres of land had been allotted to 371 Utes by April 1896. Allotments of 160 acres were issued to each head of a household, with one-half share, or 80 acres allotted to orphans, single adults, and other special cases. The Department of Indian Affairs approved these allotments in June. [20] The majority of land allotted to the Capote and Mouache Utes was within nthe La Plata, Animas, Los Pinos, and Piedra River regions. [21] On May 4, 1899, President William McKinley signed a proclamation, opening 523,079 acres of unallotted land within the Southern Ute Indian Reservation to entry under the terms of "the desert, homestead, and farm site laws and the laws governing the disposal of coal, mineral, stone, and timber lands." [22]

This action authorized Anglo-American settlement of unoccupied allotments within the Colorado portion of the Animas River Valley, wherein lies the Twin Rock Ditch headgate and the initial 2.1 miles of ditch. In Colorado, the major of land adjacent to and including the Twin Rock Ditch was privately owned patented land, except 4,540 feet of ditch in the Twin Crossing area, which traverses land owned by the Southern Ute tribe. Within the area proposed for construction, 1,320 feet of ditch cross Southern Ute land. The Twin Rocks Ditch Company holds a perpetual easement issued by the Southern Ute tribe of 60 feet, 30 feet either side of centerline for access, construction, operation, and maintenance of the Twin Rock Ditch. [23]

An affidavit, signed on December 4, 1990, by two of the three Twin Rock Ditch commissioners, states that:

> The Twin Rocks Ditch has been in the open, notorious, peaceable, continuous, and adverse possession thereof under claim of right, using said land for the construction, operation, and maintenance of an acequia for irrigation purposes, and making valuable and lasting improvements thereto for a period of 103 years last past and that no other person or entity has interrupted or prevented such use during said period of time, said land being within the County of La Plata, State of Colorado. [24]

At the time the Twin Rock and Ralston ditches were constructed (1887 and 1886, respectively), the land upon which the Colorado portion of the ditches were built was within the Southern Ute reservation, as defined in the 1874 agreement. When the reservation was opened for settlement in 1899, homesteaders took possession of those parcels of land adjacent to and including the Twin Rock Ditch that contained irrigable land. Since no irrigable land was associated with the 4,540 feet of ditch, now belonging to the Southern Utes, those parcels were never claimed. On September 14, 1938, the unallotted parcels were restored to the tribe as unsold surplus land in accordance with the provisions of the Indian Reorganization Act (IRA) of 1934. [25]

The IRA, also known as Wheeler-Howard, reversed the policy of dissolution and assimilation of tribes which characterized the allotment era. The act sought to help tribes rehabilitate their powers of self-government through adoption of governmental organizations and tribal corporations. It also recognized the importance of a stabilized tribal land base to a tribe's well-being. The act halted further allotments of land to individual Indians and returned any unallotted surplus lands to tribal ownership. Under the Dawes Act, these lands were placed with the Land Office of the Department of the Interior for sale to the general public. The proceeds were to be paid to the Indians. When the IRA was enacted, some of these lands remained unsold. Under Section 3 of the act, they could be restored to the tribes. [26]

The Southern Utes drew up a constitution and by-laws, which authorized a chairperson and a council of six members to conduct tribal affairs. In 1937, 222,012 acres of land were returned to the Southern Utes. [27]

New Mexico

Anglo-American settlement of the San Juan Basin in New Mexico began in the late 1870s when the former lands of the Navajos, Utes, and Apaches were restored to the public domain. During the 1860s, the U.S. Army was committed to subduing the Navajos, who had been raiding Spanish and Mexican frontier settlements since the 1600s. Pacification of the Navajos and Apaches was considered essential to Anglo-American occupation of the San Juan region. In 1863, approximately 8,500 Navajos were rounded up and marched to a military reservation at Bosque Redondo, Ft. Sumner, New Mexico, where they were to learn to become self-sufficient farmers. It was believed that if the nomadic tribes (Utes, Apaches and Navajos) became agriculturalists, they would assimilate more quickly into the mwinstream of American society. After several crop failures, it became apparent that the Bosque Redondo experiment was doomed. [28]

While the Navajos were still in captivity at Bosque Redondo, the New Mexico territorial government petitioned for the placement of nomadic tribes on reservations to allow Anglo-American settlement of the San Juan Valley. [29] In 1868, the Navajos signed a peace treaty with the United States Government, and were returned to their former homeland on a newly-created 3.5 million acre reservation in northeastern Arizona and northwestern New Mexico.

Even as the treaty was being discussed, officials in New Mexico recognized the inadequacies of the reservation. The Navajo were told that they would not be confined to the treaty reservation, but would be allowed to use any off-reservation areas not occupied by Anglo-American settlers. Since there were virtually no white settlers in northeastern Arizona and northwestern New Mexico, most Navajos could return to their former homes. [30]

During the 1880s, conflicts between Navajos and settlers over grazing lands intensified. By the late 1880s, ranchers had overstocked the rangelands with cattle and sheep, and competition for water and grazing rights intensified. White settlers attempted to block extension of the Navajo reservation to the east and keep Navajos off the public domain. On May 17, 1884, an executive order restored the south bank of the San Juan to the public domain and opened it to homesteading. On April 24, 1886, the area was returned to the Navajos by executive order. [31] During the 1880s and early 1890s, it was estimated that during the winter months, between one-third and one-half of the Navajos lived off the reservation on public domain and railroad lands. [32] Although the General Allotment Act of

1887 stated that any non-reservation Indian was entitled to receive an allotment on the public domain, Navajos living on the public domain were periodically ordered back to the reservation. [33]

The portion of the San Juan Valley that includes the present-day Farmington-Aztec region was traditionally a buffer zone between the fueding Utes and Navajos. It was added to the Jicarilla Apache reservation by Presidential Executive Order on March 25, 1874. The Jicarilla, however, refused to occupy the land, since it was not within their tribal range and it adjoined the land of their traditional enemy, the Navajos. The executive order was abrogated on July 10, 1876, because Anglo-American settlers desired the land and the Jicarillo had not taken possession. The land was restored to the public domain by Executive Order and opened for homesteading in 1878. Among the firs settlers to the area were cattlemen and sheepmen from Colorado and Texas, who settled along the banks of the San Juan, La Plata and Animas rivers. [34] By 1881, they numbered more than 1,000. [35]

By 1884, settlement in the Riverside area was underway and, by 1905, Riverside was a flourishing farming community serviced by a newly-constructed railroad and post office. [36] In 1887, the Anglo-Americans who settled in Riverside constructed the Twin Rock Ditch and went about the business of planting fruit orchards, alfalfa, and grain crops (wheat, barley, oats, corn), and vegetables. Fruit raising, primarily apples, was the leading industry of the Animas Valley, which included Riverside, Cedar Hill, and Aztec. Pears, peaches, cherries, plums, apricots, nectarines, and grapes were also grown. About 1887, feed corrals were located at Riverside, and a general store and school had been built at Cedar Hill, situated three miles south of Riverside, [37] Richard Ridenour ran cattle, freighted, and operated a feed lot for freighters in Riverside. His ranch was located two miles south of the Colorado-New Mexico State line. [44]

The following excerpt is from the diary of James Frazier, Edith Rhodes' grandfather, and one of the first pioneers to homestead the Bondad, Colorado, area, when the land was opened for filing in 1899, and noted names of early Riverside settlers, some of whom were probably involved in the construction of the Twin Rock Ditch.

> May 7, 1899 -- This is our first Sunday in this new western country. Our Mesa was called the Five-mile Mesa, and was closed in above and below by mountains. To the north were the high La Platas, with snow visible on them most of the year. To the east of them, whence we expected our irrigation water, when the melting snow made the water in the river most flush in May, June, July, and August, when it was most needed for crops.
>
> On our south, the mountains close into a gorge, with room for the river and wagon road, which is principally blasted out of the precipice rocks. .... You can see that while there is some agricultural land, there are vast section that are nothing but rocks and inaccessible places, that never can be made of any use. ... Our only connections with other settlements are up and down the river.
>
> Across the line in New Mexico, five or six miles down the river, are families that I have acquaintance with, and are fairly well off for the west. (At Riverside) I get my alfalfa hay for my horses at Piepers. This family, Mr. and Mrs. William Pieper and their daughter, Maggie, are my best friends, and I get much enjoyment in being with them. .... Around them is a very well-cultivated section of valley country. Mr. Ed Hendricks and family are also well fixed in orchards and irrigated alfalfa land. Mr. Dick Ridenour and family, and the Loves, are other farmers in that neighborhood. [43]

In 1905, the D&RGW Railroad built and put into operation the 47-mile-long Farming branch rail line between Durango, Colorado, and Farmington, New Mexico. With the advent of the Farmington branch rail line came the opportunity to ship perishable products (e.g., poultry, eggs, butter, small fruits, and berries) to the markets in Durango and Silverton, Colorado. Wagons were not suitable to transport these goods. [38] Today, the abandoned D&RGW railroad grade parallels portions of the Twin Rock Ditch and crosses the ditch at Twin Crossing by way of an abandoned truss bridge (see HAER Photographs No. CO-68-5 and CO-68-6).

Homesteading

The Desert Land Act of 1877 provided for entry on a compact 640-acre tract of surveyed or unsurveyed land which was neither timber nor mineral and which could not produce an agricultural crop without irrigation. At the time of filing, the applicant would pay twenty-five cents per acre, and after providing proof that he had reclaimed the land with three years, he would pay the balance of one dollar per acre and secure title to the claim. Although a number of original entries were made in the Riverside area, no final certificates were issued, in part because the terrain was mountainous and timbered, which limited the practicable extent of irrigation. [39] Entries which followed streams in a comparatively narrow strip were ruled to be illegal, since they must conform as nearly as possible in the shape of a legally subdivided section, which was a square. [40]

The majority of settlers filed for entry under the Homestead Act of 1862, or through pre-emption. A settler could secure a final certificate either by living on the homestead for five years or by commuting it through payment of cash in six months. It was then possible to acquire a 160-acre pre-emption claim with six months' residency and payment of $1.25 per acre. Simultaneously, the settler could fulfill the requirements for a timber culture claim of 160 acres, a desert land claim of 640 acres, and a timber-stone claim of 160 acres, none of which required residency as a condition of securing title. [41] The Timber and Stone Act of 1878 did not apply in New Mexico. As was the case with the desert land entries, no final timber-culture certificates were issued in the Riverside area. [42]

Transportation

The D&RGW Farmington branch as a major contributor to the economy of the region. From the time of its construction until the late 1940s, the Farmington branch transported lumber and other construction goods from Durango to Aztec and Farmington, and agricultural produce from the farms and orchards of the Animas-San Juan River communities to Durango, once a week. The Farmington branch was referred to locally as the Red Apple Flyer, so named because of its primary freight.

During the 1950s and early 1960s, major oil and gas discoveries in the four corner region boosted the volume of rail traffic and increased the frequency to daily service between Durango and Farmington. [45]

In 1967, the D&RGW Railroad filed a petition with the Interstate Commerce Commission to abandon the entire narrow gauge line from Antonito to Durango and Farmington. The Silverton branch would remain intact. The commission concurred with the recommended abandonment in July 1969. In 1970, Colorado and New Mexico developed a plan to save a portion of the D&RGW Railroad. The 64-mile-long preserved segment between Chama, New Mexico, and Antonito, Colorado, known today as the Cumbres and Toltec Scenic Railroad serves as a tourist railroad. It is still operated pprimarily

by volunteers. [46] In 1971 and 1972, the Farmington branch trackage (rails and ties) were removed. Two railroad truss bridge were left, one in Colorado spanning the Twin Rock Ditch (see HAER Photographs No. CO-68-5 and CO-68-5), and one in New Mexico, due east of the Twin Rock Ditch terminus.

D. Modifications to the Ditch

Modifications to the ditch include the 1902 enlargement and the installation of sluices, gated structures, and earth-covered corrugated metal pipe and steel tubing. The ditch was enlarged to meet increased downstream demand.

The structural features added to the original ditch, such as sluices and earth-covered pipe (see HAER Photographs No. CO-68-3, CO-68-4, and CO-68-9) were installed to improve ditch efficiency, to correct damage caused by sloughing of the steep U.S. Highway 550 embankment immediately adjacent to the ditch, and to control seepage losses.

Specific modifications made to the ditch within the portion to be affected by the Corps of Enginecrs rehabilitation project include the installation in the 1960s, 1975, and 1983 of approximately 820 feet of earth-covered corrugated metal pipe and steel tubing salvaged from the construction of Navajo Dam, and the installation of a headwall with functioning sluice gate to divert water back to the river.

Above Twin Crossing, 56 feet of 30-inch, earth-covered corrugated metal pipe were emplaced in the ditch during the 1960s. Below Twin Crossing, 698 feet of 30-inch, earth-covered steel tubing salvaged from the Navajo Dam project were emplaced in 1983, following the November 1982 flood, which washed out a portion of the ditch. [47] The Corps rehabilitation project will terminate at and tie into an existing 65-foot-long segment of earth-covered corrugated metal pipe, installed in 1975.

A sluice gate (see HAER Photograph No. CO-68-9), located 170 feet downstream (east) of the D&RGW railroad bridge, was installed by the ditch association within the last 50 years, to allow sluicing of sediment from the ditch. [48]

E. Ownership

Although a portion of the Twin Rock Ditch, including the headgate, is located in Colorado, the entire ditch is considered a New Mexico ditch. The Twin Rock Ditch was and continues to be owned and maintained by thc Twin Rocks Ditch Company, which is recognized by the New Mexico State Engineer's Office as a community ditch corporation. A community ditch corporation is essentially an association of farmers rather than a formally incorporated entity. No articles of incorporation for the Twin Rock Ditch could be located. In accordance with its bylaws, Twin Rock Ditch shall be governed by the general laws of the State of New Mexico, pertaining to community ditches.

In New Mexico, the term 'community ditch' has a well-established meaning. It was neither private nor incorporated under state law; membership was involuntary; functions were mandatory rather than permissive; and powers were not of a general corporate nature but limited to those expressly or by necessary implication granted to it. In short, a community ditch was and is a public, involuntary, quasi-corporation, which, in some jurisdictions, might be considered a private enterprise. [49]

In 1965, the New Mexico legislature declared community ditch associations to be political subdivisions of the state. Because the community ditch is a cooperative enterprise, the ditch and the right to the use of water belong to the owners of the land irrigated by the ditch.

Rights of ownership in the ditch, however, are separate and apart from the ownership of the water conveyed by the ditch. Whereas, the ditch itself is owned by the constructors as tenants in common, the water rights acquired by the parties are appurtenant to (belong with) the land irrigated and are owned by them (individually and separately). The owner, however, may lease, sell, or transfer water rights to other lands or purposes, provided that the changes can be made without detriment to the rights of other water users. [50]

Doctrine of Prior Appropriation

In 1861, the First Territorial Legislature of Colorado enacted a law stating that "all persons claiming, owning, or holding a possessory right or title to any land in the Colorado Territory that is on the bank, margin, or neighborhood of any stream of water shall be entitled to its use for agricultural purposes." [51]

Patterned after the California gold mining law of July 26, 1866, the Colorado State Constitution, set out the doctrine of prior appropriation to govern all water usage. The Colorado Constitution reaffirms that "the right to divert the unappropriated water of any natural stream to beneficial uses shall never be denied." [52]

In essence, the doctrine stated that all of the waters within a state were the property of the public, held in trust by the state. A basic premise was that the first appropriator to put water to beneficial use, regardless of the location of the lands to which it was diverted, gained priority over subsequent users. This assured farmers protection for their rights, once they had secured water through claim or purchase. [53]

With the exception of Montana, all of the interior states west of the 100th meridian, including New Mexico, have followed Colorado in incorporating the principle of state ownership or trusteeship of their surface waters, either in their constitutions or by legislative declaration. [54]

Adjudication of Water Rights

A hydrographic survey and court adjudication of water rights for the New Mexico portion of the Twin Rock Ditch was completed in 1923. [55] Petition for Colorado water was made in 1965. The Colorado and New Mexico portions of Twin Rock Ditch was decreed appropriation priority numbers of 2 and 6, respectively. [56] The authorized maximum rate of diversion or intake at the headgate for irrigation purposes is 8.62 cubic feet per second. This rate has remained unchanged to the present.

The decreed amount for the Colorado users is 2.0 cubic feet of water per second for the irrigation of 61 acres (Appropriation Priority Number 1965-2) and one-sixth of one cubic feet of water per second for the irrigation of four additional acres (1965-65). [57] The Southern Ute tribe has made no claims to water rights, since they own no irrigable lands which could be served by the ditch. [58] The decreed allotted amount for the Ne Mexico users is 958.9 acre feet for 345 irrigated acres. [59]

F. Future

Within the ditch segment proposed for rehabilitation, sloughing of the highway embankment continues to damage the Twin Rock Ditch, comprising integrity and exacerbating the maintenance problem. In addition, seepage losses occur in the 700-foot-long section cut into the porous sandstone bluff. To overcome these problems, the Corps of Engineers intends to place approximately 5,450 feet of ditch in earth-covered corrugated metal pipe (see HAER Photographs No. CO-68-11 through CO-68-18). This action will result in the removal and replacement of approximately 750 feet of existing corrugated metal and steel pipe with new corrugated metal pipe; the installation of 4,700 feet of earth-covered corrugated metal pipe in existing unlined, open channel; and the removal of one sluice gate. The existing sluice gate will cease to function, once the covered pipe is installed, and will be replaced by a sluice manhole to be installed in the pipe about 330 feet downstream of the existing sluice.

IV. FOOTNOTES

1 Water District 30, Animas River: Decrees of Adjudication, July 14, 1920, August 15, 1950.

2 Ibid.

3 Echo Ditch Company v. McDermott Ditch Company, 1 N.M. 01690 (1923).

4 Interview with Josephine Bonds by Sandra L. Rayl, Bondad, Colorado, January 18, 1991.

5 Interview with Edith Rhodes by Sandra L. Rayl, Bondad, ColorAdo, January 18, 1991.

6 Josephine Bonds interview; and Edith Rhodes interview.

7 Josephine Bonds interview.

8 U.S. Department of the Interior, Annual Report of the Commissioner of Indian Affairs to the Secretary of the Interior, Washington, D.C.: Government Printing Office, 1874.

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10 Ibid., p. 52.

11 Ibid., p. 54.

12 Ibid, p. 57-61.

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30 Bailey and Bailey, History of Navajos, p. 26.

31 Ibid., p. 89.

32 Ibid.., p. 89-90.

33 Ibid., p. 90.

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35 Bailey and Bailey, History of Navajos, p. 76.

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37 Koogler and Whitney, Aztec: A Story of Old Aztec, p. 71.

38 San Juan County Index, January 25, 1907.

39 Westphall, Victory, The Public Domain in New Mexico: 1854-1891 (Albuquer: University of New Mexico, 1965), p. 178.

40 Ibid., p. 79.

41 Ibid., p. 43.

42 Ibid., p. 176.

43 Edith Rhodes, "Excerpts from the Diary of James Frazier," in Pioneers of the San Juan Country, ed. Sarah Platt Chapter, Daughters of the American Revolution (Denver, Colorado: Big Mountain Press, 1961), pp. 185-189.

44 Koogler and Whitney, Aztec: A Story of Old Aztec, pp. 58-59.

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LONG MOUNTAIN
COLORADO LA PLATA CO
7.5' USGS

BONDAD HILL
COLORADO LA PLATA CO
7.5' USGS